

REMARKS

Favorable reconsideration of this application is respectfully requested.

Substitute figures are presented with the present response to address the objections to the drawings noted in paragraphs 4 and 5 in the Office Action. Specifically, substitute Figs. 13 and 23-26 are now labeled as "Prior Art". Further, substitute Figure 4A now includes reference signs 2A, 2B. The substitute drawings are believed to address the objections noted in the Office Action and are not believed to raise any issues of new matter.

The specification is amended by the present response to correct minor informalities. The changes made to the specification are not believed to raise any issues of new matter.

Claims 1-3 and 5-40 are pending in this application. Claim 4 is canceled by the present response without prejudice, claims 1 and 24 are amended, and claim 40 is added. Claims 8-23 and 25-39 stand withdrawn from consideration. Claims 1 and 2 were rejected under 35 U.S.C. 102(b) as anticipated by U.S. patent 5,736,443 to Park et al. (herein "Park"). Claims 1-3, 6, and 24 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. patent application publication 2004/0165443 to Harari. Claims 4 and 7 were rejected under 35 U.S.C. § 103(a) as unpatentable over Harari in view of U.S. patent 6,326,661 to Dormans et al. (herein "Dormans"). Claim 5 was rejected under 35 U.S.C. § 103(a) as unpatentable over Harari in view of Dormans, and further in view of U.S. patent 6,642,103 to Wils et al. (herein "Wils").

Addressing each of the above-noted rejections, those rejections are traversed by the present response.

Applicants initially note each of independent claims 1 and 24 is amended by the present response to clarify features recited therein. Specifically, independent claim 1 now further recites:

wherein the inter-gate insulating film includes first and second portions, the first portion contacts the floating gate, the

second portion contacts the lower surface of the first or second control gate, the first portion is a stacked film including a silicon nitride film, and the second portion is a single layer of a silicon oxide film.

Certain of those features recited in independent claim 1 were previously presented in dependent claim 4. Independent claim 24 is also similarly amended as in independent claim 1 noted above, and additionally initially recites "an inter-gate insulating film".

Features recited in amended independent claims 1 and 24 are believed to distinguish over the applied art.

Addressing first the reference to Park with respect to the rejection of claims 1 and 2, Park discloses a flash EEPROM cell having two control gates that are symmetrical to each other with respect to a floating gate. In FIG. 2E, Park shows a floating gate 13A, control gates 18A, 18B, and a dielectric layer 14. However, the control gates 18A, 18B of Park are partially formed on the floating gate 13A. Such a structure in Park differs from independent claim 1 as currently written as Park does not disclose or suggest the "inter-gate insulating film" recited in independent claim 1, and particularly that includes a first portion of a stacked film including a silicon nitride layer and a single-layer second portion of a silicon oxide film.

In view of these foregoing comments, applicants respectfully submit amended independent claim 1, and claim 2 dependent therefrom, patentably distinguish over Park.

With respect to the rejection of claims 1-3, 6, and 24 as anticipated by Harari, Harari discloses a flash NAND type EEPROM system. In Fig. 4 Harari shows floating gates 33, 34, 35 formed on tunnel oxide 91, and control gates 81-84 formed on both sides of the floating gates 33, 34, 35. Further, dielectric layer 103 is formed between the control gates 81-84 and the floating gates 33-35 and between the control gates 81-84 and tunnel oxide 91. However, similarly as in Park, Harari fails to teach or suggest the "inter-gate insulating film" that includes a first portion of a stacked film including a silicon nitride film and a second portion

of a single layer of a silicon oxide film, as recited in each of amended independent claims 1 and 24.

Further, with respect to the rejection to claims 4 and 7 under 35 U.S.C. § 103 as unpatentable over Harari in view of Dormans, and referring to the rejection of claim 4, which as noted above recited features now included in independent claims 1 and 24, the Office Action indicates that Harari discloses in paragraph [0044] that the first portion 103 is a stacked film including a silicon nitride film (ONO).¹

In response to that basis for the rejection, applicants note Harari does not disclose or suggest an inter-gate insulating film that includes first and second portions formed of different films, in contrast to the claimed features.

In other words, those portions of layers 103 in Harari that are between control gates 81-84 and floating gates 33-35 and those portions of layer 103 between control gates 81-84 and tunnel oxide layer 91 are made of the same material. Even if an ONO film is used as a dielectric layer 103 in Harari, the lower portion of each of the control gates 81-84 does not have a single-layer structure, but instead is a stacked film including an ONO film and a tunnel oxide 91. Therefore, Harari does not teach or suggest the features now recited in amended independent claims 1 and 24, and the claims dependent therefrom.

Further, the Office Action cites the teachings in Dormans at column 3, lines 40-43 and at column 4, lines 36-42 to disclose a film including first and second portions.² However, applicants respectfully submit such teachings in Dormans even if combined with Harari do not disclose the features now recited in each of amended independent claims 1 and 24, and the claims dependent therefrom.

The noted portions in Dormans at column 3, lines 40-43 and at column 4, lines 36-42 suggest an SiON film and the ONO film. However, the EEPROM disclosed in Dormans has

¹ Office Action of October 5, 2004, page 7, last paragraph.

² Office Action of October 5, 2004, page 8, second paragraph.

a cell structure including a stacked gate, and differs fundamentally from the structure recited in amended independent claims 1 and 24. More specifically, unlike the "inter-gate insulating film" recited in amended independent claims 1 and 24, the inter-gate dielectric 9 of Dormans does not include first and second portions. Thus, no combination of teachings of Harari in view of Dormans meets the limitations of amended independent claims 1 and 24, and the claims dependent therefrom.

Addressing the further rejection to claim 5 further in view of Wils, applicants note Wils is not believed to overcome the above-noted deficiencies in any of the cited art and, in fact, applicants submit Wils does not even meet the limitations of dependent claim 5 in combination with Harari and Dormans.

With respect to the further reliance on the teachings in Wils at column 4, lines 50-60, that portion of Wils discloses an aluminum oxide. However, similarly as in Dormans, that teaching in Wils is of a cell having a stacked gate structure, and the inter-gate dielectric 12 in Wils is formed of portions that are under the control gate 9. Thereby, Wils in fact even fails to disclose or suggest the structure corresponding to the "first portion" of claim 5. Thereby, claim 5 is believed to even further distinguish over the applied art.

As no other issues are pending in this application, applicants respectfully submit each of amended independent claims 1 and 24, and the claims dependent therefrom, patentably distinguish over the applied art.

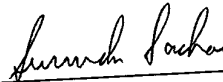
The present response also sets forth new independent claim 40 for examination, which is believed to be allowable for similar reasons as discussed above, particularly with respect to new independent claim 40 reciting an "inter-gate insulating film...", although new independent claim 40 reciting the first portion being "a single layer or stacked film containing aluminum oxide".

Further, with respect to withdrawn claims 28-39, applicants note that each of those claims incorporates subject matter from independent claim 1, which as noted above is believed to be allowable. Thereby, it is respectfully submitted that each of previously withdrawn claims 28-39 should now be reinstated in view of the allowability of claim 1 discussed above. Stated another way, applicants submit claim 1 is generic to each of claims 28-39, and as claim 1 is now allowable it is respectfully submitted that claims 28-39 must now be reinstated.

As no other issues are pending in this application, applicants respectfully submit the present application is now in condition for allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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IN THE DRAWINGS

The attached sheets of drawings include changes to Figs. 4A, 13, and 23-26. These sheets, which include Figs. 4A-4F, 13, and 23-26, replace the original sheets including Figs. 4A-4F, 13, and 23-26.

Attachment: Replacement Sheets